



# *Thyroptera discifera* (Lichtenstein & Peters, 1854) (Chiroptera: Thyropteridae): first record in the state of Sergipe, northeastern Brazil

Adriana Bocchiglieri<sup>1\*</sup>, Daiany S. dos Reis<sup>2</sup> and Déborah M. de Melo<sup>2</sup>

1 Universidade Federal de Sergipe, Departamento de Ecologia, Av. Marechal Rondon s/n, CEP 49100-000, Sergipe, SE, Brazil

2 Universidade Federal de Sergipe, Departamento de Biologia, Av. Marechal Rondon s/n, CEP 49100-000, Sergipe, SE, Brazil

\* Corresponding author. E-mail: [adriblue@hotmail.com](mailto:adriblue@hotmail.com)

**Abstract:** In Brazil, *Thyroptera discifera*, Peters' Disc-winged Bat, occurs in the Amazon basin, Cerrado, and Atlantic Forest. A lactating female was captured in an Atlantic Forest fragment in Sergipe, northeastern Brazil. This specimen represents the first record for this species from the state and increases to 46 the number of bat species known from Sergipe. Our record extends the northeastern distribution limit of the species by approximately 317 km (from the nearest previous record at Salvador, Bahia). This record also supports a rainy season to lactation period for this species.

**Key words:** Atlantic Forest; Peters' Disc-winged Bat; lactating; geographic distribution

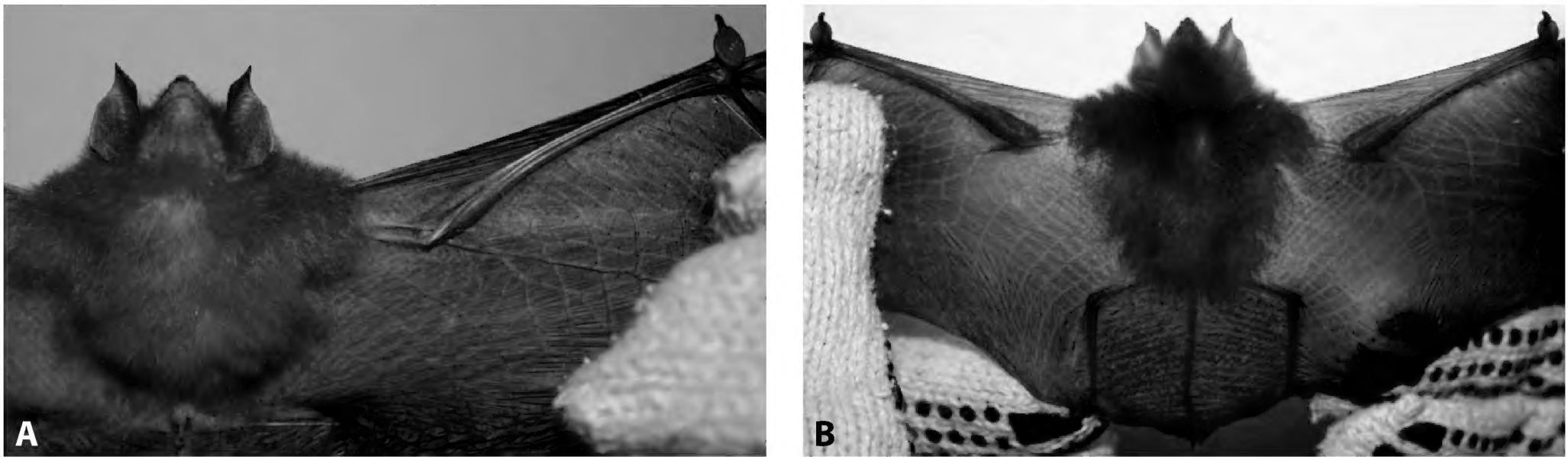
*Thyroptera* Spix, 1823 is the only genus of the family Thyropteridae (Wilson 2008). The five *Thyroptera* species in Brazil are *T. devivoi* Gregorin, Gonçalves, Lim & Engstrom, 2006, *T. discifera* (Lichtenstein & Peters, 1854), *T. lavalii* Pine, 1993, *T. tricolor* Spix, 1823, and *T. wynneae* Velazco, Gregorin, Voss & Simmons, 2014 (Nogueira et al. 2014). Representatives of this genus differ from other Neotropical bats by having suction disks at the base of the foot and thumb (Nowak 1994). Additionally, *Thyroptera* species are small bats with funnel-shaped ears, and two phalanges on the toes, with the third and fourth toes fused (Wilson 2008).

*Thyroptera discifera* is distributed from Nicaragua southward to Bolivia and eastern Brazil (Wilson 1978; Torres et al. 1988; Pine 1993; Nowak 1994; Tschapka et al. 2000) where it inhabits lowland, secondary and semideciduous forests (Tschapka et al. 2000; Sampaio et al. 2003; Bezerra et al. 2005; Velazco et al. 2014). In Brazil, this species has been reported from the states

of Amazonas, Bahia, Mato Grosso, and Pará (Mok et al. 1982; Pine 1993; Sampaio et al. 2003; Bezerra et al. 2005; Gregorin et al. 2006; Velazco et al. 2014).

*Thyroptera discifera* can be distinguished from other thyropterids by being among the smallest members of the genus, and is most similar to *T. wynneae*. However, *T. discifera* has unicolored ventral pelage, whereas *T. wynneae* presents tricolored ventral pelage. The coloration of the pelage of *T. discifera* is yellow-brown and differs from other *Thyroptera* species, which vary from grayish to light brown (Velazco et al. 2014). *Thyroptera discifera* and *T. lavalii* have one well-defined lappet but differ by a large body, bicolored ventral pelage, and a unicuspid third lower incisor in *T. lavalii* (Pine 1993). Compared with *T. devivoi*, *T. discifera* has a tail with a short free portion, long and densely whitish hairs over the uropatagium, and long and non-woolly hairs between the shoulders (Gregorin et al. 2006). The circular disks on the thumbs are similar in *T. discifera* and *T. tricolor*, but this species differs in that *T. tricolor* has a calcar with two well-defined lappets, and the ventral pelage is paler than the dorsum (Wilson 1978).

An adult female of *T. discifera* (Figure 1) was collected during a survey of the bat fauna of Refúgio da Vida Silvestre Mata do Junco (RVSMJ) in Capela municipality (10°32' S, 037°03' W), eastern portion of the state of Sergipe, northeastern Brazil (Figure 2). The RVSMJ corresponds to one of the largest fragments of the Atlantic forest in the state (1,520 ha), and is classified as a subdeciduous forest remnant in different successional stages (Santos et al. 2007). It is surrounded by an anthropogenic matrix that is mostly includes sugar cane (*Saccharum* spp.) plantations. The rainy period in area is concentrated between the months of April and August (SINDA 2015).



**Figure 1.** Female of *Thyroptera discifera* (CMUFS 0079) collected at the Refúgio da Vida Silvestre Mata do Junco, Capela, Sergipe, northeastern Brazil. **A.** Ventral view. **B.** Dorsal view. (Photos by Juan Ruiz-Esparza).

The specimen, a lactating female, was captured with a mist net (7 × 3 m) about 1.6 m above the ground on 18 May 2012 at 20:00 h (license number 2011.05.0108/00113-011 SEMARH/SE). After the capture, the skull of the specimen was removed and cleaned, while the body was preserved in 70% alcohol. The specimen was deposited at the Coleção de Mamíferos da Universidade Federal de Sergipe (CMUFS 0079).

The specimen was identified based on the characteristics described in Wilson (1978), Gregorin et al. (2006), and Velazco et al. (2014). The external and cranial measurements (in mm) were obtained using calipers (0.02 mm precision). Our specimen presented an unicolored, yellow-brown ventral pelage, a short forearm (34.6 mm) with slight hairiness, a calcar with one well-defined lappet, a tail with a short free portion (1.5 mm), and circular disks on the thumbs. Additionally our specimen presents a small foramen ovale. The first and second upper incisors are not in contact, the cusps on upper I2 are obliquely arranged relative to the long axis of the toothrow, and the lower I3 is taller than the others and has two small accessory cusps on each side. Similar to observed by Gregorin

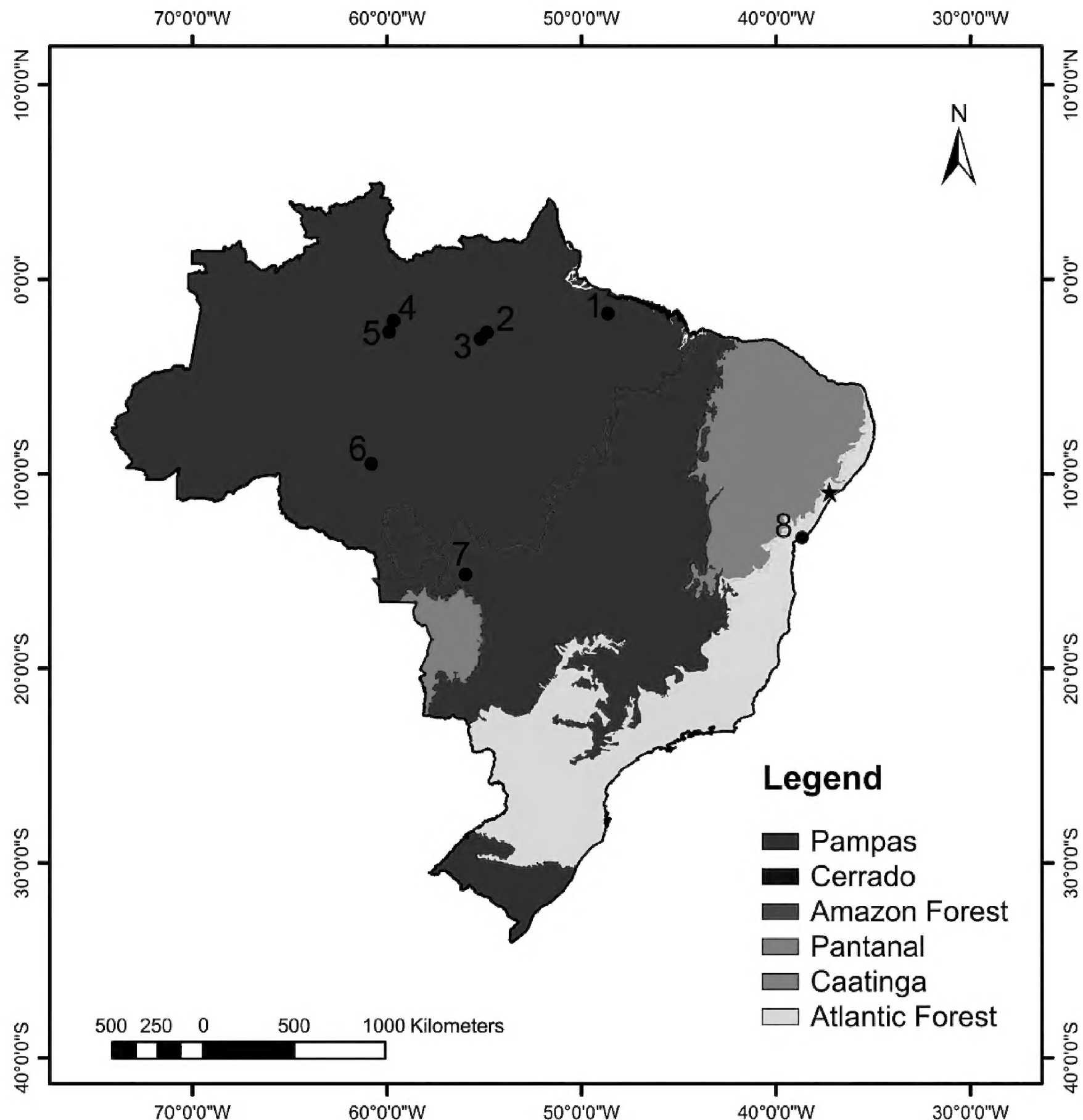
et al. (2006), the specimen from Sergipe not presents a tricuspidate 1st upper incisors and the gap separating the 1st and 2nd upper and lower premolars.

Morphological measurements obtained for the female of *T. discifera* in RVSMJ, falls within the range of variation for this species in Brazil (Pine 1993; Bezerra et al. 2005; Gregorin et al. 2006) (Table 1).

In Brazil, *T. discifera* has a disjunctive geographic distribution, having been recorded in the Amazon basin (Mok et al. 1982; Pine 1993; Sampaio et al. 2003; Velazco et al. 2014), Cerrado (Bezerra et al. 2005), and Atlantic Forest (Gregorin et al. 2006) (Figure 2). Our specimen represents the first record for the state of Sergipe and the second record from the Atlantic Forest (the previous record in Salvador, Bahia, in 1896), and this new record extends the distribution of *T. discifera* by approximately 317 km from the previously known northeastern limit (Figure 2). With this addition, the bat species richness for the RVSMJ and the state of Sergipe is increased to 20 and 46, respectively (according to Brito and Bocchiglieri 2012; Leal et al. 2013; Mikalauskas et al. 2014; Rocha et al. 2014).

**Table 1.** Measurements of *Thyroptera discifera* females from Brazil. The weight is expressed in grams and the external and cranial measurements are in millimeters.

Measurements	Pine 1993 (n=1)	Bezerra et al. 2005 (n=1)	Gregorin et al. 2006 (n=2)	This study (n=1)
Weight	–	–	–	4.0
Total length	–	66.6	–	66.3
Forearm length	35.3	38.3	33.0–34.2	34.6
Ear length	–	11.56	–	10.62
Tibia length	15.7	17.0	–	16.1
Tail length (free tail)	(1.6)	24.6	(1.4–1.7)	28.0 (1.5)
Greatest length skull	–	–	14.8	15.0
Condylolincisive length	–	14.2	13.4	14.3
Interorbital breadth	–	–	2.5	2.5
Braincase breadth	–	6.93	7.0	6.95
Zygomatic breadth	–	7.59	–	7.37
Maxillary tooththrow length	–	7.04	5.8	6.82
Mandibular tooththrow length	–	–	6.0	6.8
Mandible length	–	–	10.8	10.5



**Figure 2.** Distribution map of the known localities for *Thyroptera discifera* in Brazil (the datum used was SAD69). 1: Belém, Pará (01°27' S, 048°29' W; Pine 1993); 2: Santarém, Pará (02°26' S, 054°41' W; Velazco et al. 2014); 3: Carixicatuba, Pará (02°45' S, 055°02' W; Bezerra et al. 2005); 4: Balbina, Amazonas (01°50' S, 059°30' W; Pine 1993); 5: Manaus, Amazonas (02°24' S, 059°43' W; Sampaio et al. 2003); 6: Aripuanã, Mato Grosso (09°10' S, 060°37' W; Mok et al. 1982); 7: Hydroelectric dam of Manso, Mato Grosso (14°52' S, 055°48' W; Bezerra et al. 2005); 8: Salvador, Bahia (12°58' S, 038°30' W; Gregorin et al. 2006). The star represents the new record in Sergipe (10°32' S, 037°03' W).

*Thyroptera discifera* has a slow and maneuverable flight that makes it difficult to capture in mist nets (Tschapka et al. 2000; Bezerra et al. 2005). In Venezuela and Bolivia, this species was captured in a banana plantation, inside dry leaves (Wilson 1978; Torres et al. 1988). The thyropterids often take shelter in leaves of species of Heliconiaceae, Marantaceae, Musaceae, and Urticaceae (Findley and Wilson 1974; Wilson 1978; Torres et al. 1988; Tschapka et al. 2000; Vonhof and Fenton 2004; Velazco et al. 2014). The abundance of species of *Thyroptera*, including *T. tricolor*, is probably limited by the availability of shelters (Findley and Wilson 1974; Vonhof and Fenton 2004).

The capture of this lactating female of *T. discifera* at Sergipe in May, seems to support that lactation in this genus apparently is restricted to the rainy season (Findley and Wilson 1974; Solari et al. 2004; Dechmann et al. 2006).

Since the study of Rocha et al. (2010), the richness of bats in Sergipe increased from 27 to 46. However, different localities in this state have never been sampled or are undersampled. The intensification of inventories in the region will likely contribute to records of bat species new to northeastern Brazil and a better understanding of the distribution patterns of Brazilian bats.



## ACKNOWLEDGEMENTS

We thank SEMARH/SE and the Universidade Federal de Sergipe (UFS) for logistic support, COPES/UFS for the fellowship for DSR and DMM, and Marcelo F.G. de Brito (UFS) for map production.

## LITERATURE CITED

- Bezerra, A.M.R., F. Escarlate-Tavares, and J. Marinho-Filho. 2005. First record of *Thyroptera discifera* (Chiroptera: Thyropteridae) in the Cerrado of Central Brazil. *Acta Chiropterologica* 7(1): 165–170. doi: 10.3161/1733-5329
- Brito, D.V. and A. Bocchiglieri. 2012. Comunidade de morcegos (Mammalia, Chiroptera) no Refúgio de Vida Silvestre Mata do Junco, Sergipe, nordeste do Brasil. *Biota Neotropica* 12(3): 254–262. doi: 10.1590/S1676-06032012000300025
- Dechmann, D.K.N., K. Safi and M.J. Vonnhof. 2006. Matching morphology and diet in the Disc-winged bat *Thyroptera tricolor* (Chiroptera). *Journal of Mammalogy* 87(5): 1013–1019. <http://www.jstor.org/stable/4094271>
- Findley, J.S. and D.E. Wilson. 1974. Observations on the Neotropical Disk-Winged Bat, *Thyroptera tricolor* Spix. *Journal of Mammalogy* 55(3): 562–571. <http://www.jstor.org/stable/1379546>
- Gregorin, R., E.D.M. Gonçalves, K.L. Burton and M.D. Engström. 2006. New species of disk-winged bat *Thyroptera* and range extension for *T. discifera*. *Journal of Mammalogy* 87(2): 238–246. <http://www.jstor.org/stable/4094401>
- Leal, E.S.B., S.M. Azevêdo Júnior, F.V.P. Vila Nova, D.Q. Guerra and W.R. Telino-Júnior. 2013. Updated compilation of bat species (Chiroptera) for the Brazilian state of Sergipe, including new records. *Chiroptera Neotropica* 19(1): 1163–1178. <http://chiropteraneotropical.net/index.php/cn/article/view/72/70>
- Mikalauskas, J.S., P.A. da Rocha, D. Dias and A.L. Peracchi. 2014. Update on the distribution of *Peropteryx leuoptera* Peters, 1867 (Mammalia, Chiroptera, Emballonuridae): first record for the state of Sergipe, northeastern Brazil. *Check List* 10(2): 402–406. doi: 10.15560/10.2.402
- Mok, W.Y., D.E. Wilson, L.A. Lacey and R.C.C. Luizão. 1982. Lista atualizada de quirópteros da Amazônia brasileira. *Acta Amazonica* 12(4): 817–823. <http://acta.inpa.gov.br/fasciculos/12-4/PDF/v12n4a16.pdf>
- Nogueira, M.R., I.P. de Lima, R. Moratelli, V.C. Tavares, R. Gregorin and A.L. Peracchi. 2014. Checklist of Brazilian bats, with comments on original records. *Check List* 10(4): 808–821. doi: 10.15560/10.4.808
- Nowak, R.M. 1994. Walker's bats of the world. Baltimore and London: The John Hopkins University Press. 287 pp.
- Pine, R.H. 1993. A new species of *Thyroptera* Spix (Mammalia: Chiroptera: Thyropteridae) from the Amazon Basin of northeastern Peru. *Mammalia* 57(2): 231–225. doi: 10.1515/mamm.1993.57.2.213
- Rocha, P.A., A. Feijó, D. Dias, J. Mikalauskas, J. Ruiz-Esparza and S.F. Ferrari. 2014. Major extension of the known range of the Capixaba Nectar-feeding Bat, *Dryadonycteris capixaba* (Chiroptera, Phyllostomidae) is this rare species widely distributed in eastern Brazil? *Mastozoología Neotropical* 21(2): 361–366. <http://www.redalyc.org/articulo.oa?id=45732861018>
- Rocha, P.A., J.S. Mikalauskas, S.F. Gouveia, V.V.B. Silveira and A.L. Peracchi. 2010. Morcegos (Mammalia, Chiroptera) capturados no Campus da Universidade Federal de Sergipe, com oito novos registros para o estado. *Biota Neotropica* 10(3): 183–188. doi: 10.1590/S1676-06032010000300021
- Sampaio, E.M., E.K.V. Kalko, E. Bernard, B. Rodríguez-Herrera and C.O. Handley Jr. 2003. A biodiversity assessment of bats (Chiroptera) in a tropical lowland rainforest of Central Amazonia, including methodological and conservation considerations. *Studies on Neotropical Fauna and Environment* 38(1): 17–31. <http://repository.si.edu/handle/10088/2239>
- Santos, M.J.S., H.T.R. Souza and R.M. Souza. 2007. Biomonitoramento através de indicadores ambientais abióticos — Mata do Junco (Capela-SE). *Scientia Plena* 3(5): 142–151. <http://www.scienciaplena.org.br/sp/article/view/1199>
- SINDA (Sistema Integrado de Dados Ambientais). 2015. Dados Hidrológicos. Ministério da Ciência e Tecnologia. Accessed at <http://sinda.crn2.inpe.br/PCD>, 1 March 2016.
- Solari, S., R.A. Van Den Bussche, S.R. Hoofer and B.D. Patterson. 2004. Geographic distribution, ecology, and phylogenetic affinities of *Thyroptera lavalii* Pine 1993. *Acta Chiropterologica* 6(2): 293–302. doi: 10.3161/001.006.0207
- Torres, M.P., T. Rosas and S.I. Tiranti. 1988. *Thyroptera discifera* (Chiroptera, Thyropteridae) in Bolivia. *Journal of Mammalogy* 69(2): 434–435. <http://www.jstor.org/stable/1381410>
- Tschapka, M., A.P. Brooke and L.T. Wasserthal. 2000. *Thyroptera discifera* (Chiroptera: Thyropteridae): a new record for Costa Rica and observations on echolocation. *Zeitschrift für Säugetierkunde* 65: 193–198. [http://www.zobodat.at/pdf/Zeitschrift-Saeugetierkunde\\_65\\_0193-0198.pdf](http://www.zobodat.at/pdf/Zeitschrift-Saeugetierkunde_65_0193-0198.pdf)
- Velazco, P.M., R. Gregorin, R.S. Voss and N.B. Simmons. 2014. Extraordinary local diversity of Disk-winged bats (Thyropteridae: *Thyroptera*) in northeastern Peru, with the description of a new species and comments on roosting behavior. *American Museum Novitates* 3795: 1–28. doi: 10.1206/3795.1
- Vonnhof, M.J., H. Whitehead and M.B. Fenton. 2004. Analysis of Spix's Disc-winged Bat association patterns and roosting home ranges reveal a novel social structure among bats. *Animal Behaviour* 68: 507–521. doi: 10.1016/j.anbehav.2003.08.025
- Wilson, D.E. 1978. *Thyroptera discifera*. *Mammalian Species* 104: 1–3. <http://www.jstor.org/stable/3504064>
- Wilson, D.E. 2008. Family Thyropteridae Miller 1907; pp. 392–396, in: A.L. Gardner (ed.). *Mammals of South America: marsupials, xenarthrans, shrews and bats*, vol.1. Chicago: University of Chicago Press.

**Author contributions:** DSR and DMM collected the data, AB identified the species, and AB, DSR and DMM wrote the text.

**Received:** 13 April 2016

**Accepted:** 18 July 2016

**Academic editor:** Paúl M. Velazco